

AMENDMENTS TO THE CLAIMS

Claims 1-24 (Canceled)

25. **(Currently amended)** A magnetic resonance imaging system for imaging an artery of a patient using an administered magnetic resonance contrast agent, the magnetic resonance imaging system comprising:

a monitor unit to allow an operator to visually observe an arrival of the contrast agent in an artery of interest and determine when to start 3D gradient echo imaging; and

a magnetic resonance imaging unit to collect image data of a 3D gradient echo imaging sequence to image the artery, wherein the magnetic resonance imaging unit, ~~after the operator observes the change in the concentration of the contrast agent in the artery of interest and in response to an input from the operator~~ after arrival of the contrast agent in the artery of interest and during the arterial phase of contrast enhancement, collects image data which is representative of a ~~the~~ central portion of k-space near the beginning of the 3D gradient echo imaging sequence, ~~and wherein the operator provides the input to the magnetic resonance imaging unit after observing arrival of the contrast agent in the artery of interest and during the arterial phase of contrast enhancement.~~

26. (Previously presented) The system of claim 25 wherein the magnetic resonance imaging unit generates a series of images and wherein the monitor unit receives the images and displays the images as a temporal pattern of the arrival of the contrast agent in the artery of interest.

27. (Previously presented) The system of claim 26 wherein the magnetic resonance imaging unit generates a series of magnetic resonance pulses which are applied to the region of interest in the patient.

28. (Previously Presented) The system of claim 27 wherein the magnetic resonance pulses are radio frequency pulses.

29. (Canceled)

30. (Previously presented) The system of claim 25 further including a magnetic resonance injection unit to inject the contrast agent into the patient before or while the magnetic resonance imaging unit continuously or periodically generates images of the artery of interest that are displayed by the monitoring unit.

31. **(Currently amended)** A method of imaging an artery of a patient using magnetic resonance imaging and an administered magnetic resonance contrast agent, the method comprising:

monitoring an artery of interest to allow an operator to visually observe the arrival of the contrast agent in the artery of interest to determine when to start 3D gradient echo imaging;

collecting image data of a 3D gradient echo magnetic resonance imaging sequence, after the operator observes the arrival of the contrast agent in the artery of interest and in response to an input from the operator, wherein the image data which is representative of ~~a the~~ central portion of k-space is collected near the beginning of the imaging sequence and while the concentration of contrast agent in the artery is substantially greater than a concentration of contrast agent in veins adjacent to the artery.

32. (Canceled)

33. (Previously presented) The method of claim 31 wherein monitoring the artery of interest includes continuously or periodically monitoring the artery of interest to detect the arrival of the contrast agent in the artery of interest.

34. (Previously presented) The method of claim 31 further including administering the magnetic resonance contrast agent to the patient as a bolus type injection.

35. (Previously presented) The method of claim 31 wherein monitoring the artery of interest to observe the arrival of the contrast agent in the artery of interest includes applying a series of magnetic resonance pulses to the artery of interest in the patient.

36. (Previously presented) The method of claim 35 wherein the magnetic resonance pulses are radio frequency pulses.

37. (Previously presented) The method of claim 31 further including instructing the patient to hold his breath before collecting image data which is representative of the central portion of k-space.

38. (Previously presented) The method of claim 31 wherein monitoring the artery of interest includes visually displaying the artery of interest to allow the operator to detect the onset of the arterial phase of contrast enhancement in the artery of interest.

39. (Previously presented) The method of claim 31 wherein monitoring the artery of interest includes visually displaying the artery of interest to allow the operator to detect the arrival of the administered magnetic resonance contrast agent in the artery of interest.

40. (Previously presented) The method of claim 31 wherein monitoring the artery of interest includes visually displaying a series of images as a temporal pattern of the concentration of the contrast agent in the artery of interest to allow the operator to detect the arrival of the administered magnetic resonance contrast agent in the artery of interest.

41. (Previously presented) The method of claim 31 wherein monitoring the artery of interest includes visually displaying a series of images as a temporal pattern of the concentration of the

contrast agent in the artery of interest to allow the operator to detect the onset of the arterial phase of contrast enhancement in the artery of interest.

42. **(Currently amended)** A method of imaging an artery of a human patient using magnetic resonance imaging and an administered magnetic resonance contrast agent, the method comprising:

applying a series of magnetic resonance pulses to an artery of interest in the human patient;
measuring a response to the series of magnetic resonance pulses;
generating a series of images using the response to the series of magnetic resonance pulses;
visually displaying the series of images as a temporal pattern of the concentration of the contrast agent in the artery of interest to allow an operator to (i) detect the arrival of the administered magnetic resonance contrast agent in the artery of the human patient, or (ii) detect the onset of the arterial phase of contrast enhancement in the artery of the human patient; and

collecting image data of a 3D gradient echo magnetic resonance imaging sequence, after the operator observes the arrival of the contrast agent in the artery of interest and in response to an input from the operator, wherein the image data which is representative of ~~a the~~ central portion of k-space is collected near the beginning of the imaging sequence and during the arterial phase of contrast enhancement.

43. (Previously presented) The method of claim 42 wherein the 3D gradient echo imaging sequence is acquired in a coronal orientation and using a repetition time (RT) less than about 10 milliseconds and an echo time (TE) less than about 3 milliseconds.

44. (Previously presented) The method of claim 43 further including instructing the human patient to hold his/her breath before collecting image data which is representative of the central portion of k-space.

45. (Previously presented) The method of claim 42 wherein the artery of interest is the human patient's aorta.

46. **(New)** The system of claim 25, wherein the magnetic resonance imaging unit collects image data which is representative of a peripheral portion of k-space after it collects image data which is representative of the central portion of k-space.

47. **(New)** The system of claim 25, wherein the magnetic resonance imaging unit collects image data which is representative of a peripheral portion of k-space before arrival of the contrast agent in the artery of interest.

48. **(New)** The method of claim 31, wherein the magnetic resonance imaging unit collects image data which is representative of a peripheral portion of k-space after it collects image data which is representative of the central portion of k-space.

49. **(New)** The method of claim 31, wherein the magnetic resonance imaging unit collects image data which is representative of a peripheral portion of k-space before arrival of the contrast agent in the artery of interest.

50. **(New)** The method of claim 42, wherein the magnetic resonance imaging unit collects image data which is representative of a peripheral portion of k-space after it collects image data which is representative of the central portion of k-space.

51. **(New)** The method of claim 42, wherein the magnetic resonance imaging unit collects image data which is representative of a peripheral portion of k-space before arrival of the contrast agent in the artery of interest.